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STRUCTURE FILE UPDATES: 4 JUN 2007 HIGHEST RN 936539-19-4  
 DICTIONARY FILE UPDATES: 4 JUN 2007 HIGHEST RN 936539-19-4

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TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

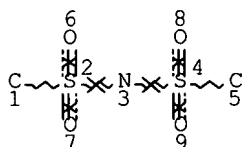
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 experimental property data in the original document. For information  
 on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

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L1 STR



#### NODE ATTRIBUTES:

NSPEC IS RC AT 1  
 NSPEC IS RC AT 5  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

#### GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 9

#### STEREO ATTRIBUTES: NONE

L2 9097 SEA FILE=REGISTRY SSS FUL L1

100.0% PROCESSED 12559 ITERATIONS  
 SEARCH TIME: 00.00.01

9097 ANSWERS

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(FILE 'HOME' ENTERED AT 12:31:19 ON 05 JUN 2007)

FILE 'REGISTRY' ENTERED AT 12:31:26 ON 05 JUN 2007  
 D SAV

ACT WEI013/A

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L1 STR  
L2 9097 SEA SSS FUL L1  
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FILE 'HCAPLUS' ENTERED AT 12:32:18 ON 05 JUN 2007

L3 1 SEA ABB=ON PLU=ON US2005100795/PN  
D IALL

FILE 'REGISTRY' ENTERED AT 12:46:27 ON 05 JUN 2007

L4 1 SEA ABB=ON PLU=ON 1120-71-4/RN  
D SCA

L5 1 SEA ABB=ON PLU=ON 1633-83-6/RN  
D SCA

L6 1 SEA ABB=ON PLU=ON SULFOLANE/CN  
D SCA

FILE 'HCAPLUS' ENTERED AT 12:53:06 ON 05 JUN 2007

SEL RN L3

FILE 'REGISTRY' ENTERED AT 12:53:13 ON 05 JUN 2007

L7 15 SEA ABB=ON PLU=ON (105-58-8/BI OR 108-32-7/BI OR  
1120-71-4/BI OR 12057-17-9/BI OR 132843-44-8/BI OR  
259194-36-0/BI OR 259194-40-6/BI OR 634598-36-0/BI OR  
634598-37-1/BI OR 68848-64-6/BI OR 7439-93-2/BI OR  
7440-44-0/BI OR 7782-42-5/BI OR 872-36-6/BI OR 96-49-1/BI  
)  
D SCA

L8 5 SEA ABB=ON PLU=ON L7 AND L2

FILE 'HCAPLUS' ENTERED AT 12:55:56 ON 05 JUN 2007

L9 QUE ABB=ON PLU=ON ELECTROLY?  
L10 2060 SEA ABB=ON PLU=ON L2(L)L9  
L11 6387 SEA ABB=ON PLU=ON L4 OR L5 OR L6  
L12 115 SEA ABB=ON PLU=ON L10 AND L11  
L13 12303 SEA ABB=ON PLU=ON APROT?(2A)SOLVENT?  
L14 13 SEA ABB=ON PLU=ON L12 AND L13  
L15 209150 SEA ABB=ON PLU=ON (TRANSITION? OR LANTHANID? OR  
LANTHANOID? OR LANTHANON? OR LNTH)(2A)METAL?  
L16 1 SEA ABB=ON PLU=ON L14 AND L15  
L17 QUE ABB=ON PLU=ON ELECTROLY?(3A)SOLUTION  
L18 QUE ABB=ON PLU=ON SULFONA? OR SULPHONA? OR SULFONY? OR  
SULPHONY? OR SOLPHONIC? OR SOLFONIC?  
L19 QUE ABB=ON PLU=ON L18(2A)(COMPOUND OR GROUP)  
L20 QUE ABB=ON PLU=ON IMIDE?(2A)ANION?  
L21 314 SEA ABB=ON PLU=ON L17 AND (L19 OR L11)  
L22 1 SEA ABB=ON PLU=ON L21 AND L20  
L23 12 SEA ABB=ON PLU=ON L21 AND L15  
L24 24 SEA ABB=ON PLU=ON L14 OR L23  
L25 1 SEA ABB=ON PLU=ON L24 AND L3  
L26 23 SEA ABB=ON PLU=ON L24 NOT L25

=&gt; fil hcap

FILE 'HCAPLUS' ENTERED AT 13:30:51 ON 05 JUN 2007

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FILE COVERS 1907 - 5 Jun 2007 VOL 146 ISS 24  
FILE LAST UPDATED: 4 Jun 2007 (20070604/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d l26 ibib abs hitstr hitind 1-23

L26 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2007:257366 HCAPLUS Full-text

DOCUMENT NUMBER: 146:320164

TITLE: Electrolyte composition

INVENTOR(S): Costello, Michael G.; Flynn, Richard M.; Segawa, Haruki

PATENT ASSIGNEE(S): 3M Innovative Properties Co., USA

SOURCE: U.S. Pat. Appl. Publ., 24pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2007054186	A1	20070308	US 2006-381862	20060505
WO 2007030297	A2	20070315	WO 2006-US32439	20060821
WO 2007030297	A3	20070510		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA			

PRIORITY APPLN. INFO.: US 2005-715291P P

200509  
08

US 2006-381862

A

200605  
05

OTHER SOURCE(S): MARPAT 146:320164

AB An electrolyte composition includes (a) a solvent composition including at least one hydrofluoroether compound, the hydrofluoroether compound including two terminal fluoroalkyl groups and an intervening substituted or unsubstituted oxymethylene group, each of the fluoroalkyl groups including only one hydrogen atom and, optionally, at least one catenated (i.e., in-chain) heteroatom, with the proviso that, when the oxymethylene group is unsubstituted, at least one of the terminal fluoroalkyl groups is branched and/or includes at least one catenated heteroatom; and (b) at least one electrolyte salt.

INCL 429200000; 429341000; 429326000; 429330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte electrochem oxidative  
stability fluoroether; hydrofluoro glycol ether addn synthesis  
battery **electrolyte** salt **soln**

IT Acids, uses

Alkali metal salts

Alkaline earth salts

Group IIB element compounds

Group IIIB element compounds

Quaternary ammonium compounds, uses

Rare earth salts

**Transition metal** salts

RL: PRP (Properties); TEM (Technical or engineered material use);

USES (Uses)

(battery electrolyte composition with high stability containing salts and  
hydrofluoro ethers and glycol ethers)

IT **Transition metal** oxides

RL: TEM (Technical or engineered material use); USES (Uses)

(lithium alkali metal oxides, cathode; battery electrolyte composition  
with high stability containing salts and hydrofluoro ethers and  
glycol ethers)

IT Alkali **metal** oxides

RL: TEM (Technical or engineered material use); USES (Uses)

(lithium **transition metal** oxides, cathode;  
battery electrolyte composition with high stability containing salts and  
hydrofluoro ethers and glycol ethers)

IT Cyclic voltammetry

Flammability

Stability

Surface tension

(of **electrolyte solns.**; battery

**electrolyte** composition with high stability containing salts and  
hydrofluoro ethers and glycol ethers)

IT Aromatic **compounds**

RL: TEM (Technical or engineered material use); USES (Uses)

(**sulfonates**; battery electrolyte composition with high  
stability containing salts and hydrofluoro ethers and glycol ethers)

IT 870778-34-0P

RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic  
preparation); PREP (Preparation)

(synthesis of and use in **electrolyte solns.**;

battery **electrolyte** composition with high stability containing  
salts and hydrofluoro ethers and glycol ethers)

L26 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2007:87334 HCAPLUS Full-text

DOCUMENT NUMBER: 146:187484

TITLE: Secondary nonaqueous electrolyte battery and its manufacture

INVENTOR(S): Takeuchi, Takashi; Saito, Takaya; Shirane, Takayuki; Ueda, Atsushi

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: PCT Int. Appl., 53pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007010915	A1	20070125	WO 2006-JP314224	20060719
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
JP 2007053083	A	20070301	JP 2006-196526	20060719
PRIORITY APPLN. INFO.:				JP 2005-210929 A
				20050721

AB The battery has a cathode comprising a **transition metal**-containing composite oxide as a cathode active mass, an anode containing a Li-intercalating anode active mass, a separator, and an nonaq. **electrolyte solution**; where the nonaq. **electrolyte solution** contains  $\geq 1$  1st additive selected from ethylene sulfite, propylene sulfite and propane sultone, and  $\geq 1$  2nd additive selected from maleic anhydride, vinylene carbonate, vinyl ethylene carbonate and LiBF<sub>4</sub>, and the charging final voltage is set at 4.3-4.5V. The battery is manufactured by assembling an electrode group containing the cathode, the anode, and the separator, and the required **electrolyte soln.** into a battery case, and charging the battery at a high voltage  $\geq 1$  time.

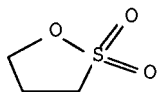
IT 1120-71-4, Propane sultone

RL: MOA (Modifier or additive use); USES (Uses)

(structure and manufacture of secondary lithium batteries containing additive modified **electrolyte solns.**)

RN 1120-71-4 HCAPLUS

CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Secondary batteries  
(lithium; structure and manufacture of secondary lithium batteries containing additive modified **electrolyte solns.**)

IT Battery electrolytes  
(structure and manufacture of secondary lithium batteries containing additive modified **electrolyte solns.**)

IT 108-31-6, Maleic anhydride, uses 872-36-6, Vinylene carbonate  
1120-71-4, Propane sultone 1469-73-4, Propylene sulfite  
3741-38-6, Ethylene sulfite 4427-96-7, Vinyl ethylene carbonate  
14283-07-9, Lithium tetrafluoroborate  
RL: MOA (Modifier or additive use); USES (Uses)  
(structure and manufacture of secondary lithium batteries containing additive modified **electrolyte solns.**)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate  
623-53-0, Ethyl methyl carbonate 7440-21-3, Silicon, uses  
7631-86-9, Silicon oxide, uses 7782-42-5, Graphite, uses  
9002-88-4, Polyethylene 9003-07-0, Polypropylene 12190-79-3,  
Cobalt lithium oxide (CoLiO<sub>2</sub>) 21324-40-3, Lithium  
hexafluorophosphate 500912-67-4, Cobalt lithium manganese nickel  
oxide (Co<sub>0.33</sub>Li<sub>1.05</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 906548-33-2, Cobalt lithium  
manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.05</sub>Mn<sub>0.01</sub>Ni<sub>0.66</sub>O<sub>2</sub>) 906548-34-3,  
Aluminum cobalt lithium nickel oxide (Al<sub>0.03</sub>Co<sub>0.15</sub>Li<sub>1.01</sub>Ni<sub>0.82</sub>O<sub>2</sub>)  
921436-58-0, Lithium manganese nickel oxide (Li<sub>1.05</sub>Mn<sub>0.33</sub>Ni<sub>0.67</sub>O<sub>2</sub>)  
921436-59-1, Cobalt lithium manganese nickel oxide  
(Co<sub>0.01</sub>LiMn<sub>0.33</sub>Ni<sub>0.66</sub>O<sub>2</sub>) 921436-60-4, Cobalt lithium manganese  
nickel oxide (Co<sub>0.35</sub>LiMn<sub>0.33</sub>Ni<sub>0.32</sub>O<sub>2</sub>) 921436-61-5, Cobalt lithium  
manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.33</sub>Ni<sub>0.27</sub>O<sub>2</sub>) 921436-62-6, Cobalt  
lithium nickel oxide (Co<sub>0.33</sub>Li<sub>1.05</sub>Ni<sub>0.67</sub>O<sub>2</sub>) 921436-65-9, Cobalt  
lithium manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.05</sub>Mn<sub>0.5</sub>Ni<sub>0.17</sub>O<sub>2</sub>)  
921436-66-0, Cobalt lithium manganese nickel oxide  
(Co<sub>0.33</sub>Li<sub>1.05</sub>Mn<sub>0.55</sub>Ni<sub>0.12</sub>O<sub>2</sub>) 921436-68-2 921436-69-3  
921436-70-6 921436-71-7 921436-72-8  
RL: TEM (Technical or engineered material use); USES (Uses)  
(structure and manufacture of secondary lithium batteries containing additive modified **electrolyte solns.**)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:977382 HCAPLUS Full-text

DOCUMENT NUMBER: 145:360086

TITLE: Nonaqueous electrolytes for lithium ion  
batteries

INVENTOR(S): Chen, Zonghai; Amine, Khalil

PATENT ASSIGNEE(S): The University of Chicago, USA

SOURCE: U.S. Pat. Appl. Publ., 20pp.  
CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006210883	A1	20060921	US 2006-373054	20060310
WO 2006101779	A2	20060928	WO 2006-US8664	20060310
WO 2006101779	A3	20070322		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.:

US 2005-662056P

P

20050315

OTHER SOURCE(S): MARPAT 145:360086

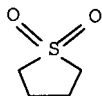
AB The present invention is generally related to electrolytes containing anion receptor additives to enhance the power capability of lithium-ion batteries. The anion receptor of the present invention is a Lewis acid that can help to dissolve LiF in the passivation films of lithium-ion batteries. Accordingly, one aspect the invention provides electrolytes comprising a lithium salt; a polar **aprotic solvent**; and an anion receptor additive; and wherein the electrolyte solution is substantially non-aqueous. Further there are provided electrochem. devices employing the electrolyte and methods of making the electrolyte.

IT 126-33-0, Sulfolane

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolytes for lithium ion batteries)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

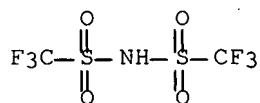


IT 90076-65-6 132843-44-8

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolytes** for lithium ion batteries)

RN 90076-65-6 HCAPLUS

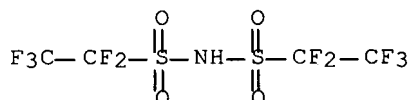
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-pentafluoroethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

INCL 429326000; 429329000; 429200000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT **Solvents**

(aprotic, polar; nonaq. electrolytes for lithium ion batteries)

IT 60-29-7, Diethyl ether, uses 79-20-9, Methyl acetate 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-60-4, Propyl acetate 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2D, Lithium, salt 39457-42-6, Lithium manganese oxide 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(nonaq. electrolytes for lithium ion batteries)

IT 78-19-3, 3,9-Divinyl-2,4,8,10-tetraoxaspiro[5,5]undecane 84-15-1, o-Terphenyl 84-15-1D, o-Terphenyl, aryloxy compound 86-74-8D, Carbazole, aryloxy compound 88-12-0, 1-Vinylpyrrolidin-2-one, uses 91-19-0, Quinoxaline 91-20-3, Naphthalene, uses 91-22-5, Quinoline, uses 91-22-5D, Quinoline, aryloxy compound 92-52-4, Biphenyl, uses 96-49-1D, Ethylene carbonate, diaryloxy compound 96-54-8, n-Methylpyrrole 101-84-8, Diphenyl ether 101-84-8D, Diphenyl ether, diaryloxy compound 102-09-0, Diphenyl carbonate 102-09-0D, Phenyl carbonate, aryloxy compound 102-09-0D, Phenyl carbonate, diaryloxy compound 102-71-6, Triethanolamine, uses 106-92-3, Allylglycidyl ether 106-99-0, Butadiene, uses 108-32-7D, Propylene carbonate, diaryloxy compound 109-93-3, Divinyl ether 109-97-7D, Pyrrole, aryloxy compound 109-99-9D, Thf, aryloxy compound 110-00-9D, Furan, diaryloxy compound 110-86-1, Pyridine, uses 110-89-4, Piperidine, uses 110-89-4D, Piperidine, aryloxy compound 111-34-2, Butyl vinyl ether 119-65-3, Isoquinoline 120-72-9, Indole, uses 120-92-3D, Cyclopentanone, aryloxy compound 140-67-0, 4-Allylanisole 142-96-1D, Butyl ether, aryloxy compound 176-53-4D, Ethylene silicate, aryloxy compound 176-53-4D, Ethylene silicate, diaryloxy compound 287-23-0D, Cyclobutane, aryloxy compound 288-32-4, Imidazole, uses 288-32-4D, Imidazole, aryloxy compound



289-80-5, Pyridazine 289-80-5D, Pyridazine, aryloxy compound  
 289-95-2, Pyrimidine 290-37-9, Pyrazine 290-37-9D, Pyrazine,  
 aryloxy compound 291-37-2D, Cyclotriphosphazene, diaryloxy compound  
 503-30-0D, Oxetane, aryloxy compound 614-99-3D, Ethyl-2-furoate,  
 aryloxy compound 856-46-2, Tris(4-fluorophenyl) borate 930-22-3  
 1072-53-3D, Ethylene sulfate, aryloxy compound 1072-53-3D, Ethylene  
 sulfate, diaryloxy compound 1072-60-2, 2-Vinyltetrahydrofuran  
 1095-03-0, Triphenyl borate 1109-15-5,  
 Tris(pentafluorophenyl)borane 1118-58-7 1337-81-1 1917-10-8,  
 Vinyl-2-furoate 3741-38-6D, Ethylene sulfite, aryloxy compound  
 3741-38-6D, Ethylene sulfite, diaryloxy compound 3893-03-6,  
 4-Methoxy-o-terphenyl 4177-16-6, Vinyl pyrazine 4245-37-8, Vinyl  
 methacrylate 4370-23-4, 1-Vinyl-piperidin-2-one 4427-96-7, Vinyl  
 ethylene carbonate 5009-27-8D, Cyclopropanone, 2-aryl derivative  
 5009-27-8D, Cyclopropanone, 2-aryloxy derivative 5009-27-8D,  
 Cyclopropanone, aryloxy compound 6622-92-0, 2,4-Dimethyl-6-hydroxy-  
 pyrimidine 6919-80-8, Tris(1,1,1,3,3,3-hexafluoropropan-2-yl)  
 borate 7570-02-7, Divinyl carbonate 7791-03-9 10411-26-4D,  
 Butyl carbonate, diaryloxy compound 11099-06-2D, Ethyl silicate,  
 diaryloxy compound 12789-45-6, MEthyl phosphate 12789-45-6D,  
 Methyl phosphate, diaryloxy compound 13537-32-1D, Fluorophosphoric  
 acid, alkyl derivative, lithium salt 14265-44-2D, Phosphate, aryloxy  
 compound 14283-07-9, Lithium tetrafluoroborate 14861-06-4, Vinyl  
 crotonate 15896-04-5 16410-02-9, 1-Vinylaziridin-2-one  
 18358-13-9D, Methacrylate, aryloxy compound 19024-82-9, Phosphoric  
 acid, trivinyl ester 21324-40-3, Lithium hexafluorophosphate  
 21994-23-0 23462-75-1, Dihydropyran-3-one 23542-71-4  
 24213-83-0, Pyrazine, 2,5-divinyl 29383-23-1, Vinylimidazole  
 29935-35-1, Lithium hexafluoroarsenate 30676-86-9, Piperidine,  
 vinyl 30851-79-7 31094-36-7, Quinoline, vinyl 32766-52-2,  
 Tris(1,1,1,3,3,3-hexafluoro-2-(trifluoromethyl)propan-2-yl) borate  
 32893-16-6, Methyl vinyl carbonate 33454-82-9, Lithium triflate  
 33879-62-8, 2-Vinyloxetane 34721-16-9D, Furoate, 2-aryloxy compound  
 34721-16-9D, Furoate, 2-diaryloxy derivative 35143-18-1 36885-49-1,  
 Vinyl phosphate 37203-76-2, Ethyl phosphate 38888-98-1,  
 Diphenylethane 41824-21-9D, Crotonate, aryloxy compound  
 41824-21-9D, Crotonate, diaryloxy compound 44414-27-9 44866-76-4  
 50337-14-9, 3-Vinylcyclopentanone 51222-11-8 53627-36-4,  
 $\beta$ -Vinyl- $\gamma$ -butyrolactone 55849-58-6 61548-40-1,  
 Anisole, allyl 65967-52-4 66166-61-8, 3-Vinylcyclobutanone  
 66281-01-4 66281-16-1 66956-76-1 72607-84-2,  
 2,4-Divinyl-1,3-dioxane 75454-86-3 77208-21-0 **90076-65-6**  
 104531-81-9 117823-03-7 121712-01-4, 1-Vinylazetid-2-one  
 125812-49-9 132404-42-3 **132843-44-8** 139669-84-4  
 146355-12-6, Tris(pentafluorophenyl)borate 210834-28-9,  
 Tris(1,1,1,3,3,3-hexafluoro-2-phenylpropan-2-yl) borate  
 210834-35-8, Tris(2,4-difluorophenyl) borate 210834-37-0,  
 Tris(2,3,5,6-tetrafluorophenyl) borate 210834-40-5,  
 Tris(3-(trifluoromethyl)phenyl) borate 210834-42-7,  
 Tris(3,5-bis(trifluoromethyl)phenyl) borate 244761-29-3, Lithium  
 bisoxalatoborate 247229-51-2 365458-32-8, 2-(2,4-Difluorophenyl)-  
 4-fluoro-1,3,2-benzodioxaborole 365458-33-9 365458-34-0  
 365458-35-1 365458-36-2 365458-37-3 365458-38-4 365458-39-5  
 365458-40-8 402564-35-6, 2-(3-Trifluoromethylphenyl)-4-fluoro-  
 1,3,2-benzodioxaborole 409071-16-5 557084-91-0 678966-16-0  
 856785-12-1 866947-06-0 891828-02-7 891828-03-8 891828-04-9  
 891828-05-0 891828-06-1 891831-48-4 897028-09-0 897028-10-3  
 897028-11-4 897028-12-5, 2-Amino-4-vinylcyclobutanone  
 897028-13-6 897028-14-7 897028-15-8 897028-16-9 897028-17-0  
 897028-18-1 897028-19-2 897028-20-5 897028-22-7 897028-23-8

897028-24-9 897028-25-0 897028-26-1 897028-27-2 897028-28-3  
 897028-28-3D, diaryloxy compound 897381-31-6 897381-32-7  
 897381-34-9 897381-36-1 897381-37-2 897381-38-3 897381-41-8  
 897381-42-9 897381-44-1 897381-45-2 897381-46-3 897381-47-4  
 908587-13-3 908587-22-4 908599-70-2 908599-71-3 908599-72-4  
 908599-74-6 910038-86-7 910038-87-8 910038-88-9  
 910041-64-4D, aryloxy compound 910041-65-5D, diaryloxy compound

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. **electrolytes** for lithium ion batteries)

L26 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:736454 HCAPLUS Full-text

DOCUMENT NUMBER: 145:170734

TITLE: Improvements relating to electrolyte  
 compositions for batteries using sulphur or  
 sulphur compounds

INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena

PATENT ASSIGNEE(S): Oxis Energy Limited, UK

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

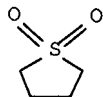
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006077380	A2	20060727	WO 2006-GB103	20060111
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
GB 2422244	A	20060719	GB 2005-1001	20050118
GB 2422244	B	20070110		
PRIORITY APPLN. INFO.:			GB 2005-1001	A 20050118
			US 2005-652769P	P 20050215

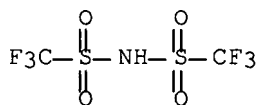
AB There are disclosed electrolytes comprising solns. of lithium salts with large anions in polar **aprotic solvents** with a particular concentration of background salts. The concentration of the background salts is selected to be equal or close to the concentration of a saturated solution of these salts in the **aprotic solvents** used. The electrolytes disclosed can be used in chemical sources of

elec. energy such as secondary cells and batteries comprising sulfur-based pos. active materials. The use of such electrolytes increases cycling efficiency and cycle life of the cells and batteries.

IT 126-33-0, Sulfolane 90076-65-6, Lithium  
bis(trifluoromethane sulfonyl)imide  
RL: DEV (Device component use); USES (Uses)  
(improvements relating to **electrolyte** compns. for  
batteries using sulfur or sulfur compds.)  
RN 126-33-0 HCAPLUS  
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
lithium salt (1:1) (CA INDEX NAME)

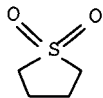


● Li

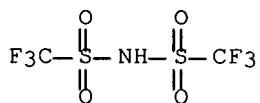
IC ICM H01M  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT **Solvents**  
(**aprotic**; improvements relating to electrolyte compns.  
for batteries using sulfur or sulfur compds.)  
IT 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran  
96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate  
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
109-60-4, Propyl acetate 109-99-9, Thf, uses 110-71-4  
111-96-6, Diglyme 126-33-0, Sulfolane 141-78-6, Ethyl  
acetate, uses 143-24-8, Tetraglyme 616-38-6, Dimethyl carbonate  
623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane  
1977-37-3, Methylpropyl sulfone 7439-93-2, Lithium, uses  
7440-23-5, Sodium, uses 7440-44-0D, Carbon, alkali metal  
intercalation compound 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur,  
compds. 7782-42-5D, Graphite, alkali metal intercalation compound  
7791-03-9, Lithium perchlorate 21324-40-3, Lithium  
hexafluorophosphate 25085-53-4, Celgard 2500 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9,  
Methyl propyl carbonate, uses 74432-42-1, Lithium polysulfide  
90076-65-6, Lithium bis(trifluoromethane sulfonyl)imide  
RL: DEV (Device component use); USES (Uses)  
(improvements relating to **electrolyte** compns. for  
batteries using sulfur or sulfur compds.)

DOCUMENT NUMBER: 145:30918  
 TITLE: Electrolyte for lithium-sulfur batteries  
 INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena  
 PATENT ASSIGNEE(S): Oxis Energy Ltd., UK  
 SOURCE: PCT Int. Appl., 24 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006059085	A1	20060608	WO 2005-GB4572	20051129
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
GB 2420907	A	20060607	GB 2005-4290	20050302
GB 2420907	B	20060913	RU 2004-135236	A 20041202
PRIORITY APPLN. INFO.:				
			GB 2005-4290	A 20050302
			US 2005-657436P	P 20050302
AB	An electrolyte for a lithium-sulfur battery, the electrolyte comprising a solution of at least one electrolyte salt in at least two <b>aprotic solvents</b> . The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.			
IT	126-33-0, Sulfolane 90076-65-6			
	RL: DEV (Device component use); USES (Uses) ( <b>electrolyte</b> for lithium-sulfur batteries)			
RN	126-33-0 HCAPLUS			
CN	Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)			



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
 lithium salt (1:1) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran  
 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 108-32-7,  
 Propylene carbonate 109-60-4, Propyl acetate 109-99-9, Thf, uses  
 110-71-4 111-96-6, Diglyme 126-33-0, Sulfolane  
 141-78-6, Ethyl acetate, uses 143-24-8, Tetraglyme 554-12-1,  
 Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl  
 methyl carbonate 646-06-0, 1,3-Dioxolane 917-73-7 1003-78-7,  
 2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone 7439-93-2,  
 Lithium, uses 7560-59-0, Methylbutylsulfone 7791-03-9, Lithium  
 perchlorate 12136-58-2, Lithium sulfide 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate  
 56525-42-9, Methyl propyl carbonate, uses 90076-65-6  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for lithium-sulfur batteries)  
 REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2006:529227 HCAPLUS Full-text  
 DOCUMENT NUMBER: 145:11315  
 TITLE: Electrolyte for lithium-sulfur batteries and  
 lithium sulfur batteries using the same  
 INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena  
 PATENT ASSIGNEE(S): Oxis Energy Limited, UK; Intellikraft Limited  
 SOURCE: Brit. UK Pat. Appl., 23 pp.  
 CODEN: BAXXDU  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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GB 2420907	A	20060607	GB 2005-4290	200503

GB 2420907 B 20060913  
 WO 2006059085 A1 20060608 WO 2005-GB4572

02

200511

29

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,  
 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,  
 KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG,  
 MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT,  
 RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT,  
 TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,  
 IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,  
 TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
 ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

US 2006121355 A1 20060608 US 2005-290825

200512

01

PRIORITY APPLN. INFO.:

RU 2004-135236

A

200412

02

GB 2005-4290

A

200503

02

US 2005-657436P

P

200503

02

AB An electrolyte for a lithium-sulfur battery comprises a solution of  $\geq 1$  electrolyte salt in  $\geq 2$  **aprotic solvents**. The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.

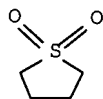
IT 126-33-0, Sulfolane 90076-65-6, Lithium  
 bis(trifluoromethanesulfonyl)imide

RL: NUU (Other use, unclassified); TEM (Technical or engineered  
 material use); USES (Uses)

(lithium sulfur battery **electrolytes**)

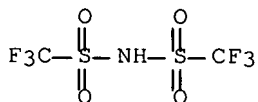
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
 lithium salt (1:1) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 49  
 IT 79-20-9, Methylacetate 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  
 γ-Butyrolactone 96-49-1, Ethylene carbonate 105-37-3,  
 Ethylpropionate 105-58-8, Diethylcarbonate 108-32-7, Propylene  
 carbonate 109-60-4, Propylacetate 109-99-9, THF, uses 110-71-4  
 111-96-6, Diglyme 124-38-9, Carbon dioxide, uses 126-33-0  
 , Sulfolane 141-78-6, Ethylacetate, uses 143-24-8, Tetraglyme  
 554-12-1, Methylpropionate 616-38-6, Dimethylcarbonate 623-53-0,  
 Ethylmethylcarbonate 646-06-0, 1,3-Dioxolane 1003-78-7,  
 2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone 7439-93-2D,  
 Lithium, derivs. 7446-09-5, Sulfur dioxide, uses 7560-59-0,  
 Methylbutylsulfone 7704-34-9D, Sulfur, derivs./polymers  
 7782-50-5, Chlorine, uses 7791-03-9, Lithium perchlorate  
 10024-97-2, Dinitrogen oxide, uses 18496-25-8, Sulfide  
 20461-54-5, Iodide, uses 21324-40-3, Lithium hexafluorophosphate  
 24959-67-9, Bromide, uses 25322-68-3, Polyethylene oxide  
 29935-35-1, Lithium hexafluoroarsenate 31124-38-6,  
 Ethylbutylsulfone 33454-82-9, Lithium trifluoromethane sulfonate  
 39448-96-9 56525-42-9, Methylpropylcarbonate, uses 74432-42-1,  
 Lithium sulfide (Li<sub>2</sub>(Sx)) 90076-65-6, Lithium  
 bis(trifluoromethanesulfonyl)imide  
 RL: NUU (Other use, unclassified); TEM (Technical or engineered  
 material use); USES (Uses)

(lithium sulfur battery **electrolytes**)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:1239360 HCAPLUS Full-text

DOCUMENT NUMBER: 144:8990

TITLE: Polymerelectrolyte secondary lithium batteries  
 with long cycle life and good stability at high  
 temperature

INVENTOR(S): Wada, Yoshihiko; Miura, Katsuhito; Matsui,  
 Shohei; Tabuchi, Masato

PATENT ASSIGNEE(S): Daiso Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005327566	A	20051124	JP 2004-143916	200405

PRIORITY APPLN. INFO.:

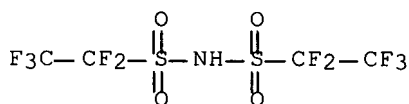
JP 2004-143916

13

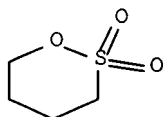
200405

13

- AB The batteries have crosslinked polymer electrolyte compns. consisting of (a) multi-component copolymer polyethers with Mw 104-107, (b) **aprotic** organic **solvents**, (c) low-mol.-weight S compds. and/or N compds. as additives, and (d) Li salts as electrolytes. In the batteries, side reactions between electrodes and electrolytes are prevented by the additives c.
- IT **132843-44-8**, Lithium bis(perfluoroethylsulfonyl)imide  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolytes** containing polyoxyalkylenes; thermally stable secondary lithium batteries containing sulfur and/or nitrogen compds. in polymer **electrolytes**)
- RN 132843-44-8 HCAPLUS
- CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-pentafluoroethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



- IT **1633-83-6**, 1,4-Butanesultone  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (thermally stable secondary lithium batteries containing sulfur and/or nitrogen compds. in polymer electrolytes)
- RN 1633-83-6 HCAPLUS
- CN 1,2-Oxathiane, 2,2-dioxide (CA INDEX NAME)



- IC ICM H01M010-40  
 ICS C08G065-321; C08K003-00; C08K005-00; C08L071-00; H01M006-18
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- IT 14283-07-9, Lithium tetrafluoroborate **132843-44-8**, Lithium bis(perfluoroethylsulfonyl)imide  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolytes** containing polyoxyalkylenes; thermally stable secondary lithium batteries containing sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 120-72-9D, Indole, derivs. 288-14-2D, Isoxazole, derivs. 288-32-4D, Imidazole, derivs. 288-42-6, Oxazole 289-80-5D, Pyridazine, derivs. 289-95-2D, Pyrimidine, derivs. 290-37-9D, Pyrazine, derivs. 352-93-2, Diethyl sulfide 597-35-3, Diethyl sulfone 617-92-5, 1-Ethylpyrrole 1600-44-8, Tetramethylene



sulfoxide 1633-83-6, 1,4-Butanesultone 3741-38-6, Glycol  
sulfite 7189-69-7, 1,1'-Sulfonyldiimidazole 12654-97-6D,  
Triazine, derivs. 74124-79-1, N,N'-Disuccinimidyl carbonate  
RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)

(thermally stable secondary lithium batteries containing sulfur  
and/or nitrogen compds. in polymer electrolytes)

L26 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2005:450127 HCAPLUS Full-text  
DOCUMENT NUMBER: 142:484803  
TITLE: Electrolytic solutions and secondary batteries  
using them  
INVENTOR(S): Utsuki, Koji; Kusachi, Yuki; Yamazaki, Ikiko  
PATENT ASSIGNEE(S): NEC Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
JP 2005135701	A	20050526	JP 2003-369360	200310 29
PRIORITY APPLN. INFO.:				JP 2003-369360 200310 29

OTHER SOURCE(S): MARPAT 142:484803

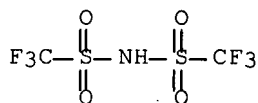
AB The solns. contain **aprotic solvents** and vinyl disulfones. The batteries,  
preferably secondary Li batteries, show less capacity drop after repeated charge  
discharge cycles by forming protective films of the vinyl disulfones on electrodes.

IT 90076-65-6 132843-44-8 189217-56-9

RL: DEV (Device component use); USES (Uses)  
(**electrolyte; electrolytic** solns. containing  
**aprotic solvents** and vinyl disulfones for  
secondary batteries)

RN 90076-65-6 HCAPLUS

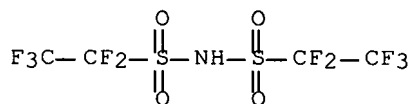
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
lithium salt (1:1) (CA INDEX NAME)



● Li

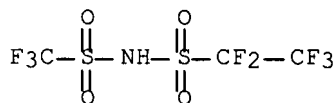
RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-  
pentafluoroethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 189217-56-9 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-  
[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)

● Li

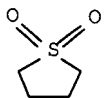
IT 126-33-0, Sulfolane 1120-71-4, 1,3-Propanesultone

1633-83-6, 1,4-Butanesultone

RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)(protective films on electrodes from; electrolytic solns. containing  
**aprotic solvents** and vinyl disulfones for  
secondary batteries)

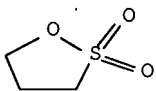
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



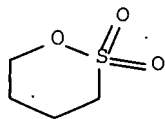
RN 1120-71-4 HCAPLUS

CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



RN 1633-83-6 HCAPLUS

CN 1,2-Oxathiane, 2,2-dioxide (CA INDEX NAME)



- IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **aprotic solvent** vinyldisulfone electrolytic soln  
 lithium battery  
 IT Sulfonic acids, uses  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
 (alkanesulfonic, anhydrides, protective films on electrodes from;  
 electrolytic solns. containing **aprotic solvents**  
 and vinyldisulfones for secondary batteries)  
 IT Ethers, uses  
 RL: DEV (Device component use); USES (Uses)  
 (**aprotic solvents**; electrolytic solns. containing  
**aprotic solvents** and vinyldisulfones for  
 secondary batteries)  
 IT **Solvents**  
 (**aprotic**; electrolytic solns. containing **aprotic**  
**solvents** and vinyldisulfones for secondary batteries)  
 IT Sulfonic acids, uses  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
 (cyclic disulfonic acid esters, protective films on electrodes  
 from; electrolytic solns. containing **aprotic**  
**solvents** and vinyldisulfones for secondary batteries)  
 IT Carbonates, uses  
 RL: DEV (Device component use); USES (Uses)  
 (cyclic or linear, **aprotic solvents**;  
 electrolytic solns. containing **aprotic solvents**  
 and vinyldisulfones for secondary batteries)  
 IT Ethers, uses  
 RL: DEV (Device component use); USES (Uses)  
 (cyclic, **aprotic solvents**; electrolytic  
 solns. containing **aprotic solvents** and  
 vinyldisulfones for secondary batteries)  
 IT Battery electrolytes  
 Electrolytic solutions  
 (electrolytic solns. containing **aprotic solvents**  
 and vinyldisulfones for secondary batteries)  
 IT Carboxylic acids, uses  
 RL: DEV (Device component use); USES (Uses)  
 (esters, aliphatic, **aprotic solvents**;  
 electrolytic solns. containing **aprotic solvents**  
 and vinyldisulfones for secondary batteries)  
 IT Secondary batteries  
 (lithium; electrolytic solns. containing **aprotic**  
**solvents** and vinyldisulfones for secondary batteries)  
 IT Lactones  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
 (sultones,  $\gamma$ -, protective films on electrodes from;  
 electrolytic solns. containing **aprotic solvents**  
 and vinyldisulfones for secondary batteries)

- IT Lactones  
RL: DEV (Device component use); USES (Uses)  
( $\gamma$ -, **aprotic solvents**; electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
108-32-7, Propylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(**aprotic solvent**; electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 508200-28-0, Lithium manganese nickel titanium oxide  
( $\text{LiMn}_{1.35}\text{Ni}_{0.5}\text{Ti}_{0.15}\text{O}_4$ ) 849641-89-0, Lithium manganese oxide  
( $\text{LiMnO}_4$ )  
RL: DEV (Device component use); USES (Uses)  
(cathode active mass; electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 7791-03-9, Lithium perchlorate 14024-11-4, Aluminum lithium chloride ( $\text{AlLiCl}_4$ ) 14283-07-9, Lithium tetrafluoroborate  
18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate  
90076-65-6 132843-44-8 189217-56-9  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte**; **electrolytic** solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 872-36-6, Vinylene carbonate  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 108771-33-1 852157-07-4  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(protective film on electrodes from; electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)
- IT 126-33-0, Sulfolane 1120-71-4, 1,3-Propanesultone  
1633-83-6, 1,4-Butanesultone 28452-93-9D, Sulfolene, derivs.  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(protective films on electrodes from; electrolytic solns. containing **aprotic solvents** and vinyladisulfones for secondary batteries)

L26 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:823614 HCAPLUS Full-text

DOCUMENT NUMBER: 141:334876

TITLE: Electrolyte solution for secondary battery and the battery

INVENTOR(S): Kusachi, Yuki; Utsuki, Koji

PATENT ASSIGNEE(S): NEC Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 27 pp.

CODEN: JKXXAF

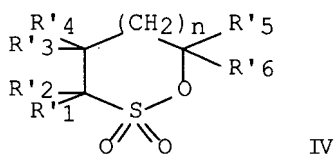
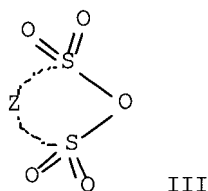
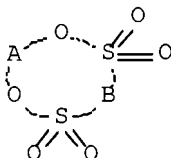
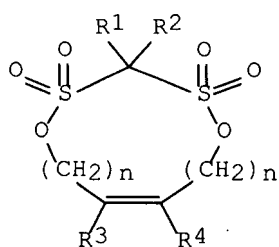
DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004281325	A	20041007	JP 2003-74054	20030318
PRIORITY APPLN. INFO.:			JP 2003-74054	20030318
OTHER SOURCE(S):		MARPAT 141:334876		
GI				



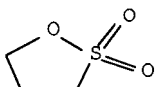
AB The electrolyte solution contains an **aprotic solvent** and an unsatd. cyclic disulfonate ester I, where R1-R4 = H, Me, Et, or halogen and n = integer 0-2. The electrolyte solution may also contain II [A = (substituted) C1-5 (fluoro)alkylene, carbonyl, sulfinyl, or bivalent C2-6 group containing ether bond connected (fluoro)alkylene units; B = (substituted) alkylene group], III [Z = (substituted) C2-4 alkylene, alkenylene, aromatic or heterocyclic group], or IV (n = integer 0-2, R'1-R'6 = H C1-12 alkyl, C3-6 cycloalkyl, or C6-12 aryl group). The battery is a secondary Li battery.

IT 1120-71-4, 1,3-Propanesultone 259194-36-0  
259194-40-6 634598-36-0 634598-37-1

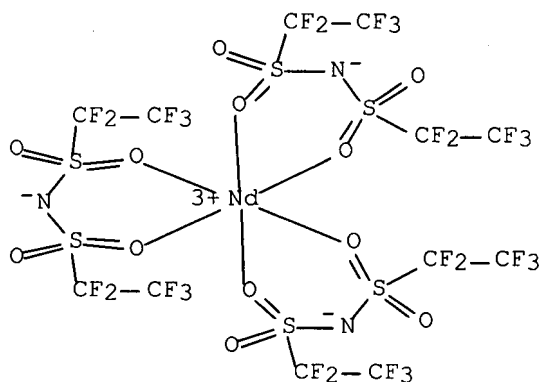
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** solns. containing cyclic disulfonate esters  
and other additives for secondary lithium batteries)

RN 1120-71-4 HCAPLUS

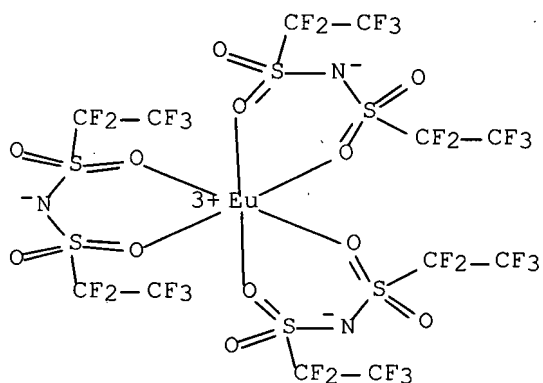
CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



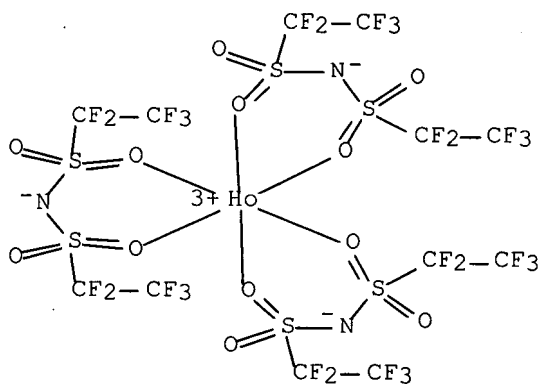
RN 259194-36-0 HCAPLUS  
 CN Neodymium, tris[1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl- $\kappa$ O]ethanesulfonamidato- $\kappa$ O]-, (OC-6-11)-(9CI) (CA INDEX NAME)



RN 259194-40-6 HCAPLUS  
 CN Europium, tris[1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl- $\kappa$ O]ethanesulfonamidato- $\kappa$ O]-, (OC-6-11)-(9CI) (CA INDEX NAME)

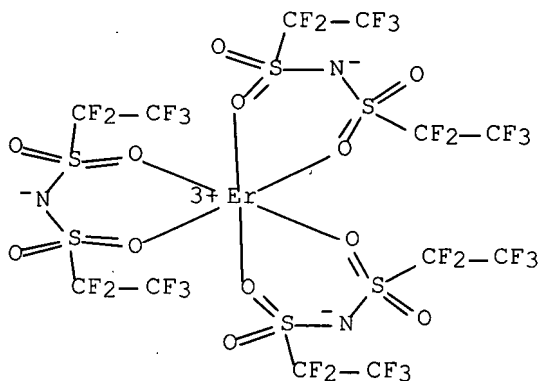


RN 634598-36-0 HCAPLUS  
 CN Holmium, tris[1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl- $\kappa$ O]ethanesulfonamidato- $\kappa$ O]-, (OC-6-11)-(9CI) (CA INDEX NAME)



RN 634598-37-1 HCAPLUS

CN Erbium, tris[1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl-  
kappa O]ethanesulfonamidato-kappa O]-, (OC-6-11)-(9CI) (CA INDEX  
NAME)

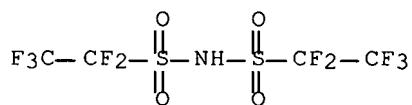


IT 132843-44-8

RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. containing cyclic disulfonate esters  
for secondary lithium batteries)

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-  
pentafluoroethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40

ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 872-36-6, Vinylene carbonate 1120-71-4, 1,3-Propanesultone

14913-52-1, Neodymium ion (Nd<sup>3+</sup>), uses 18472-30-5, Erbium ion (Er<sup>3+</sup>), uses 22541-18-0, Europium ion (Eu<sup>3+</sup>), uses 22541-22-6, Holmium ion (Ho<sup>3+</sup>), uses 259194-36-0 259194-40-6 634598-36-0 634598-37-1

RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** solns. containing cyclic disulfonate esters and other additives for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate 132843-44-8

RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing cyclic disulfonate esters for secondary lithium batteries)

L26 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:739384 HCAPLUS Full-text

DOCUMENT NUMBER: 141:246085

TITLE: Electrolyte for secondary battery and the battery

INVENTOR(S): Utsuki, Koji; Hasegawa, Etsuo

PATENT ASSIGNEE(S): NEC Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

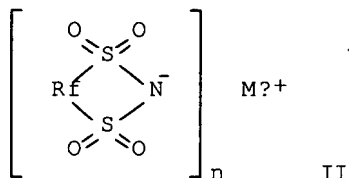
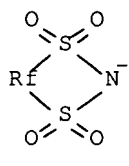
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004253296	A	20040909	JP 2003-43813	20030221
PRIORITY APPLN. INFO.:			JP 2003-43813	20030221

OTHER SOURCE(S): MARPAT 141:246085  
GI

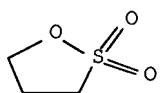


AB The electrolyte contains an aprotic solvent, a cyclic perfluoroalkyldisulfonimide anion, and a **transition metal** ion. The anion is preferably I, where R = linear or branched C2-4 perfluoroalkyl group, the **transition metal** is a **lanthanoide**, and the electrolyte may also contain other organic solvents. Another type of electrolyte contains an aprotic solvent, a Li salt, and a **transition metal** ion-cyclic



perfluoroalkyldisulfonimide anion complex II (n = 1-3, M = **transition metal**). The battery is a secondary Li battery.

IT 1120-71-4, 1,3-Propanesultone  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing **transition metal** ion and cyclic perfluoroalkyldisulfonimide anion for secondary lithium batteries)  
 RN 1120-71-4 HCAPLUS  
 CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-02; H01M004-38; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery electrolyte **transition metal** cyclic perfluoroalkyldisulfonimide  
 IT Battery **electrolytes**  
 (electrolyte solns. containing **transition metal** ion and cyclic perfluoroalkyldisulfonimide anion for secondary lithium batteries)  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 108-32-7, Propylene carbonate 872-36-6, Vinylene carbonate  
 1120-71-4, 1,3-Propanesultone 21324-40-3, Lithium  
 hexafluorophosphate 750646-05-0 750646-06-1 750646-07-2  
 750646-08-3 750646-09-4 750646-10-7 750646-11-8 750646-12-9  
 750646-13-0  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing **transition metal** ion and cyclic perfluoroalkyldisulfonimide anion for secondary lithium batteries)

L26 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:570455 HCAPLUS Full-text

DOCUMENT NUMBER: 141:91879

TITLE: Method of preparation of electrolyte for nonaqueous battery

INVENTOR(S): Itaya, Masaharu; Miyake, Masahide; Fujimoto, Masahisa; Koga, Hideyuki; Donoue, Kazunori

PATENT ASSIGNEE(S): Japan

SOURCE: U.S. Pat. Appl. Publ., 7 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2004137324	A1	20040715	US 2003-743746	200312 24
JP 2004213991	A	20040729	JP 2002-381184	200212

NO

JP 2004265677

A

20040924

JP 2003-53549

27

200302

28

PRIORITY APPLN. INFO.:

JP 2002-381184

A

200212

27

JP 2003-53549

A

200302

28

AB An electrolyte for a nonaq. battery according to the present invention consists essentially of magnesium bistrifluoromethanesulfonimide. An **electrolytic solution** for a nonaq. battery according to the present invention includes the magnesium bistrifluoromethanesulfonimide, and an organic solvent such as a cyclic carbonate, a chain carbonate, a cyclic ether and a chain ether or an ordinary temperature molten salt having a m.p. of 60° or less in which the magnesium bistrifluoromethanesulfonimide is dissolved.

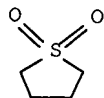
IT 126-33-0, Sulfolane

RL: DEV (Device component use); USES (Uses)

(method of preparation of electrolyte for nonaq. battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40

INCL 429188000; 429330000; 429338000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Crown ethers

Lactones

Transition metal sulfides

RL: DEV (Device component use); USES (Uses)

(method of preparation of electrolyte for nonaq. battery)

IT 79-20-9, Methyl acetate 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-29-2 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4 126-33-0, Sulfolane 463-79-6D, Carbonic acid, ester, chain 463-79-6D, Carbonic acid, ester, cyclic 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 1309-48-4, Magnesium oxide, uses 1333-38-6, Angelica lactone 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 22251-34-9, Ethoxymethoxymethane 51311-17-2, Carbon fluoride 60871-83-2, Magnesium triflate 73506-93-1, Diethoxyethane 114435-02-8, FluoroEthylene carbonate 133395-16-1 268536-05-6, Trimethylpropylammonium-bis-(trifluoromethylsulfonyl)imide

RL: DEV (Device component use); USES (Uses)

(method of preparation of electrolyte for nonaq. battery)

L26 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

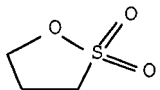
ACCESSION NUMBER: 2004:181920 HCAPLUS Full-text

DOCUMENT NUMBER: 140:184814

TITLE: **Electrolyte solution for**  
 secondary battery  
 INVENTOR(S): Utsugi, Koji; Kusachi, Yuki; Yamazaki, Ikiko  
 PATENT ASSIGNEE(S): NEC Corporation, Japan  
 SOURCE: Eur. Pat. Appl., 35 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1394888	A1	20040303	EP 2003-90268	200308 22
EP 1394888	B1	20060412		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2004281368	A	20041007	JP 2003-289432	200308 07
US 2004043300	A1	20040304	US 2003-647541	200308 26
US 7163768	B2	20070116		
KR 2004019994	A	20040306	KR 2003-59849	200308 28
CN 1495959	A	20040512	CN 2003-132755	200308 29
PRIORITY APPLN. INFO.:				
			JP 2002-250441	A 200208 29
			JP 2003-52588	A 200302 28
			JP 2003-289432	A 200308 07

AB The present invention provides a technol. of inhibiting the decomposition of the solvent of the **electrolyte solution** for a secondary battery. Further, the present invention provides a technol. of prohibiting the resistance increase of a secondary battery and improving the storage properties such as improving the capacity retention ratio. An **electrolyte solution** comprising non-proton solvent and cyclic sulfonic ester including at least two **sulfonyl groups** may be used.  
 IT 1120-71-4, 1,3-Propanesultone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solution for secondary battery)  
 RN 1120-71-4 HCAPLUS  
 CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **electrolyte soln** secondary battery

IT Ethers, uses  
RL: DEV (Device component use); USES (Uses)  
(cyclic; **electrolyte solution** for secondary battery)

IT Battery **electrolytes**  
(**electrolyte solution** for secondary battery)

IT Ethers, uses  
Rare earth complexes  
Transition metal complexes  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte solution** for secondary battery)

IT Carboxylic acids, uses  
RL: DEV (Device component use); USES (Uses)  
(esters, aliphatic; **electrolyte solution** for secondary battery)

IT Sulfonic acids, uses  
RL: DEV (Device component use); USES (Uses)  
(esters, cyclic; **electrolyte solution** for secondary battery)

IT Secondary batteries  
(lithium; **electrolyte solution** for secondary battery)

IT Lactones  
RL: DEV (Device component use); USES (Uses)  
(γ-; **electrolyte solution** for secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
108-32-7, Propylene carbonate 463-79-6D, Carbonic acid, ester, cyclic 463-79-6D, Carbonic acid, ester, linear 497-62-1  
872-36-6, Vinylene carbonate 7429-90-5, Aluminum, uses  
7439-93-2, Lithium, uses 7440-00-8D, Neodymium, complex  
7440-44-0, Carbon, uses 7440-52-0D, Erbium, complex 7440-53-1D, Europium, complex 7440-60-0D, Holmium, complex 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 12057-17-9, Lithium manganese oxide  $\text{LiMn}_2\text{O}_4$  14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 113066-89-0, Cobalt lithium nickel oxide  $\text{Co}_{0.2}\text{LiNi}_{0.8}\text{O}_2$  132843-44-8  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte solution** for secondary battery)

IT 1120-71-4, 1,3-Propanesultone 14913-52-1, Neodymium(3+), uses 18472-30-5, Erbium(3+), uses 22541-18-0, Europium(3+), uses 22541-22-6, Holmium(3+), uses 37181-39-8, Triflate 99591-73-8 99591-74-9 99591-80-7 259194-36-0 259194-40-6 634598-36-0 634598-37-1 659737-87-8 659737-88-9 659737-89-0 659737-90-3  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte solution** for secondary battery)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2003:1007381 HCAPLUS Full-text  
DOCUMENT NUMBER: 140:62297  
TITLE: Cellulose- and chitin-reinforced polymer  
matrix-based ionic conductors for use as battery  
electrolytes  
INVENTOR(S): Cavaille, Jean Yves; Dufresne, Alain; Paillet,  
Michel; My, Ahmed Said Azizi Samir; Alloin,  
Fannie; Sanchez, Jean Yves  
PATENT ASSIGNEE(S): Institut National Polytechnique de Grenoble, Fr.  
SOURCE: Fr. Demande, 35 pp.  
CODEN: FRXXBL  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
FR 2841255	A1	20031226	FR 2002-7746	200206 21
FR 2841255	B1	20051028		
CA 2489582	A1	20031231	CA 2003-2489582	200306 20
WO 2004001888	A2	20031231	WO 2003-FR1908	200306 20
WO 2004001888	A3	20050203		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003258822	A1	20040106	AU 2003-258822	200306 20
EP 1520318	A2	20050406	EP 2003-760765	200306 20
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1675792	A	20050928	CN 2003-819806	200306 20
JP 2005530882	T	20051013	JP 2004-514969	

US 2006102869 A1 20060518 US 2005-518638 200306  
 20  
 200511  
 21  
 PRIORITY APPLN. INFO.: FR 2002-7746 A 200206  
 21  
 WO 2003-FR1908 W 200306  
 20

AB A reinforced polymeric ionic conductor, especially suitable as an electrolyte for rechargeable lithium batteries, consists of a polymer matrix, an ionic component, and a reinforcing agent, in which: (1) the matrix polymer is a polar solvating polymer, a non-solvating polymer containing ionic acids (e.g., grafted ionic acids), or a mixture of the above polymer(s) with an aprotic polar liquid, (2) the ionic component is selected from salts and acids, or has a anionic or cationic group covalently bonded to the polymer, or is an association of the two, and (3) the reinforcing agent is a cellulose or chitin derivative. Polymer matrixes are suitably homopolymers and copolymers of vinylidene difluoride, acrylonitrile, methacrylonitrile, alkyl acrylates and methacrylates, and ethylene oxide. The ionic acid groups on the polymer are preferably perfluorosulfonates or perfluorocarboxylates. Suitable aprotic polar liqs. include linear and cyclic ethers acetals, and carbonates; esters, nitriles, amides, sulfones, sulfolanes, alkylsulfamides, and halogenated hydrocarbons. Electron conductors can also be added to aid in the ionic conduction, such as acetylene black, carbon black, and insertable metals, metal oxides, and salts.

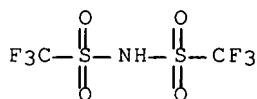
IT 82113-65-3 82113-65-3D, salts

RL: DEV (Device component use); USES (Uses)

(battery **electrolytes** containing; cellulose- and  
 chitin-reinforced polymer matrix-based ionic conductors for use  
 as battery **electrolytes**)

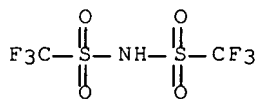
RN 82113-65-3 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
 (CA INDEX NAME)



RN 82113-65-3 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
 (CA INDEX NAME)

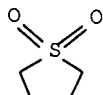


IT 126-33-0, Sulfolane

RL: DEV (Device component use); USES (Uses)  
 (polar aprotic, battery electrolytes containing; cellulose- and  
 chitin-reinforced polymer matrix-based ionic conductors for use  
 as battery electrolytes)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM C08L101-12

ICS H01B001-12; H01M004-60; H01M008-10; H01M010-40; H01L031-04;  
 H01G009-025; G02F001-153; C08L001-00; C08L005-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 37

IT Polar solvents

(aprotic, battery electrolytes containing; cellulose- and  
 chitin-reinforced polymer matrix-based ionic conductors for use  
 as battery electrolytes)

IT 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-32-6,  
 Titanium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses  
 7601-90-3, Perchloric acid, uses 7664-38-2, Phosphoric acid, uses  
 7664-38-2D, Phosphoric acid, salts 7782-42-5, Graphite, uses  
 10402-24-1, Iron phosphate 75533-68-5, Methanetrissulfonyl  
 trifluoride 75533-68-5D, Methanetrissulfonyl trifluoride, salts  
 82113-65-3 82113-65-3D, salts

RL: DEV (Device component use); USES (Uses)

(battery electrolytes containing; cellulose- and  
 chitin-reinforced polymer matrix-based ionic conductors for use  
 as battery electrolytes)

IT 126-33-0, Sulfolane 463-79-6D, Carbonic acid, linear and  
 cyclic esters

RL: DEV (Device component use); USES (Uses)

(polar aprotic, battery electrolytes containing; cellulose- and  
 chitin-reinforced polymer matrix-based ionic conductors for use  
 as battery electrolytes)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:475993 HCAPLUS Full-text

DOCUMENT NUMBER: 139:351253

TITLE: A new type of polymer gel electrolyte:

zwitterionic liquid/polar polymer mixture

AUTHOR(S): Ohno, Hiroyuki; Yoshizawa, Masahiro; Ogihara,  
 Wataru

CORPORATE SOURCE: Department of Biotechnology, Tokyo University of  
 Agriculture and Technology, Koganei, Tokyo,  
 184-8588, Japan

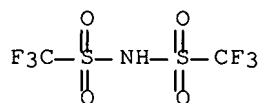
SOURCE: Electrochimica Acta (2003), 48(14-16), 2079-2083  
 CODEN: ELCAAV; ISSN: 0013-4686

PUBLISHER: Elsevier Science Ltd.

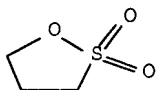
DOCUMENT TYPE: Journal

LANGUAGE: English

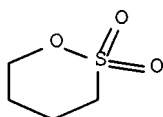
- AB Imidazolium based zwitterionic salts were prepared by 1-step reaction of 1-ethylimidazole and alkylsulfonates. The zwitterionic salts dissociate into ions but the ions do not migrate along with the potential gradient, making them suitable non-volatile polar solvents for guest salts. The zwitterionic salts obtained are 1-ethylimidazolium-3-n-propanesulfonate and -butanesulfonate. The salts were mixed with an equimolar amount of lithium bis(trifluoromethanesulfonyl)imide to provide a thermally stable electrolyte solution. This mixture was further mixed with the copolymer of vinylidene fluoride and hexafluoropropylene (Kynar Flex 2751), to prepare a polymer gel electrolyte. The polymer gel electrolytes have zwitterionic liquid content up to 80%; for mixts. with 66% zwitterionic liquid, the ionic conductivity is about  $10^{-5}$  S/cm at  $50^{\circ}$  and showed no weight loss up to  $390^{\circ}$  in TGA studies.
- IT 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide  
 RL: PRP (Properties)  
 (preparation of liquid ion-conducting imidazolium zwitterionic-Li salt and mixts. with fluoropolymer as polymer gel electrolytes)
- RN 90076-65-6 HCAPLUS
- CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



- IT 1120-71-4, 1,3-Propanesultone 1633-83-6,  
 1,4-Butanesultone  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of liquid ion-conducting imidazolium zwitterionic-Li salt and mixts. with fluoropolymer as polymer gel electrolytes)
- RN 1120-71-4 HCAPLUS
- CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



- RN 1633-83-6 HCAPLUS
- CN 1,2-Oxathiane, 2,2-dioxide (CA INDEX NAME)



- CC 37-5 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 72, 76



IT Polar **solvents**  
(**aprotic**; preparation of liquid ion-conducting imidazolium  
zwitterionic-Li salt and mixts. with fluoropolymer as polymer gel  
electrolytes)

IT 9011-17-0, Kynar Flex 2751 **90076-65-6**, Lithium  
bis(trifluoromethanesulfonyl)imide  
RL: PRP (Properties)  
(preparation of liquid ion-conducting imidazolium zwitterionic-Li salt  
and mixts. with fluoropolymer as polymer gel **electrolytes**  
)

IT **1120-71-4**, 1,3-Propanesultone **1633-83-6**,  
1,4-Butanesultone 7098-07-9, 1-Ethylimidazole  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation of liquid ion-conducting imidazolium zwitterionic-Li salt  
and mixts. with fluoropolymer as polymer gel electrolytes)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2003:353882 HCAPLUS Full-text  
DOCUMENT NUMBER: 138:371695  
TITLE: Nonaqueous **electrolyte**  
**solution** and Secondary battery using the  
electrolyte

INVENTOR(S): Hinohara, Akio; Hayashi, Takeshi; Ishida,  
Tatsuaki; Hirano, Kazuo  
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003132946	A	20030509	JP 2001-326630	200110 24

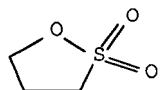
PRIORITY APPLN. INFO.: JP 2001-326630  
200110  
24

AB The **electrolyte solution** contains a borate ester of the formula B(OR1)(OR2)(OR3)  
(R1-3 = H, metal, or organic group), a nonaq. solvent mixture, and an electrolyte  
salt. The battery has a Li-intercalating anode; a cathode., containing a Li  
**transition metal** composite oxide, a conductive polymer material and a carbonaceous  
material; and the above **electrolyte solution**

IT **1120-71-4**  
RL: MOA (Modifier or additive use); USES (Uses)  
(non. **electrolyte solns.** containing borate esters  
for secondary lithium batteries)

RN 1120-71-4 HCAPLUS

CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M004-02; H01M004-58  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT Battery **electrolytes**  
Secondary batteries  
(non. **electrolyte solns.** containing borate esters  
for secondary lithium batteries)  
IT 7782-42-5, Graphite, uses  
RL: DEV (Device component use); USES (Uses)  
(anode; non. **electrolyte solns.** containing borate  
esters for secondary lithium batteries)  
IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl carbonate  
12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 21324-40-3, Lithium  
hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(non. **electrolyte solns.** containing borate esters  
for secondary lithium batteries)  
IT 688-74-4, Tributyl borate 872-36-6, Vinylene carbonate  
1120-71-4 14945-31-4, 2-Sulfobenzoic acid anhydride  
34577-43-0 518336-38-4  
RL: MOA (Modifier or additive use); USES (Uses)  
(non. **electrolyte solns.** containing borate esters  
for secondary lithium batteries)

L26 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2003:113327 HCAPLUS Full-text  
DOCUMENT NUMBER: 138:140080  
TITLE: High energy density hybrid  
battery/supercapacitor system  
INVENTOR(S): Amatucci, Glenn  
PATENT ASSIGNEE(S): Telcordia Technologies, Inc., USA  
SOURCE: U.S., 9 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
US 6517972	B1	20030211	US 2000-650364	200009 29
PRIORITY APPLN. INFO.:			US 2000-650364	200009 29

AB A rechargeable hybrid battery/supercapacitor elec. storage system capable of providing high energy and high power densities comprises a neg. intercalation electrode and a pos. capacitor electrode comprising an anion-adsorbing component and a cation-intercalating material combined with a separator and elec.-conductive current collector elements to form a unitary cell structure. An **electrolyte solution** of a dissociable salt absorbed into the porous structure of the separator

provides complementary ion species which, supplemented by cations supplied from the pos. electrode intercalation material in order to increase the energy d. capability of the system, resp. reversibly intercalate into the neg. electrode and capacitively adsorb at the surface of the pos. electrode upon the application of charging current. The high d. stored elec. energy may be rapidly recovered at high power over extended periods upon demand of a utilizing device and may be equally rapidly restored to stable high energy capacity through numerous charging cycles.

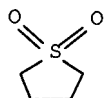
IT 126-33-0, Sulfolane

RL: DEV (Device component use); USES (Uses)

(high energy d. hybrid battery/supercapacitor system)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M004-58

ICS H01G009-00

INCL 429231100; 429231900; 429231950; 429231800; 429009000; 361582000;  
361503000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 76

IT **Transition metal** halides

RL: DEV (Device component use); USES (Uses)

(fluorides; high energy d. hybrid battery/supercapacitor system)

IT Alkali metal compounds

Alkaline earth compounds

Carbon fibers, uses

Carbonaceous materials (technological products)

Intercalation compounds

**Transition metal** oxides

**Transition metal** sulfides

RL: DEV (Device component use); USES (Uses)

(high energy d. hybrid battery/supercapacitor system)

IT Fluorides, uses

RL: DEV (Device component use); USES (Uses)

(**transition metal**; high energy d. hybrid  
battery/supercapacitor system)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

108-32-7, Propylene carbonate 110-71-4 126-33-0,

Sulfolane 616-38-6, Dimethyl carbonate 623-96-1, Dipropyl

carbonate 7664-38-2D, Phosphoric acid, **transition**

**metal** compds. 7791-03-9, Lithium perchlorate 12031-95-7,

Lithium titanium oxide 14283-07-9, Lithium manganese

oxide 12057-17-9, Lithium manganese

oxide 14283-07-9, Lithium tetrafluoroborate 21324-40-3,

Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate

33454-82-9, Lithium triflate 73506-93-1, Diethoxyethane

90076-65-6

RL: DEV (Device component use); USES (Uses)

(high energy d. hybrid battery/supercapacitor system)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

ACCESSION NUMBER: 2001:185833 HCAPLUS Full-text  
 DOCUMENT NUMBER: 134:223194  
 TITLE: Ionically conductive polymers containing boron atoms useful for polymer electrolytes and electrical devices  
 INVENTOR(S): Nishiura, Masahito; Kono, Michiyuki; Watanabe, Masayoshi  
 PATENT ASSIGNEE(S): Dai-Ichi Kogyo Seiyaku Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 58 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001018094	A1	20010315	WO 2000-JP5811	20000828
W: CA, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001072875	A	20010321	JP 1999-248887	19990902
JP 3557959	B2	20040825		
JP 2001072876	A	20010321	JP 1999-248888	19990902
JP 3557960	B2	20040825		
JP 2001072877	A	20010321	JP 1999-248889	19990902
JP 3557961	B2	20040825		
JP 2001131246	A	20010515	JP 1999-318000	19991109
CA 2344204	A1	20010315	CA 2000-2344204	20000828
CA 2344204	C	20070213		
EP 1160268	A1	20011205	EP 2000-955080	20000828
EP 1160268	B1	20040804		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
EP 1428849	A1	20040616	EP 2004-2946	20000828
EP 1428849	B1	20060405		
R: DE, FR, IT				
EP 1428850	A1	20040616	EP 2004-2947	20000828
EP 1428850	B1	20050504		
R: DE, FR, IT				
US 2004202912	A1	20041014	US 2004-835816	

200404  
30

US 7045242	B2	20060516		
PRIORITY APPLN. INFO.:			JP 1999-248887	A 199909 02
			JP 1999-248888	A 199909 02
			JP 1999-248889	A 199909 02
			JP 1999-318000	A 199911 09
			EP 2000-955080	A3 200008 28
			WO 2000-JP5811	W 200008 28
			US 2001-787233	B1 200104 25

AB The polymers are of the following types: (1) a dendrimer-like polymer having trivalent B atom at core and wedge point, a heteroatom such as O as linking unit (L), and di- to hexavalent group with mol. weight of  $\geq 150$  linking to the B atom via L, (2) a compound obtained by crosslinking of a multiarm polymer of  $B(XRY)_3$  type [X = heteroatom; R = divalent group having mol. weight of  $> 150$  (e.g., polyoxyethylene group); Y = polymerizable functional group], (3) a high-mol. compound bearing B atom preferably on side chain end or main chain end, and (4) high-mol. compound containing tetravalent B. The polymer electrolytes with improved charge-carrying ion capacities are obtained by mixing one or more types of the polymers above with an electrolyte salt such as a lithium salt and an **aprotic solvent**, e.g., carbonates, lactones, ether, etc., and can be used in batteries or capacitors. Thus, coupling a diol derived from ethylene oxide ring opening reaction with borane gave a 3-arm polymer, 1 g of which was combined with  $LiBF_4$  at 1 mol/kg and 2.3 g  $\gamma$ -butyrolactone and cast coated on a glass surface to give a film of polymer electrolyte.

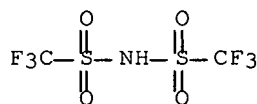
IT 90076-65-6 132843-44-8

RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(B-containing multiarm or dendritic polyoxyalkylene polymer complexes; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

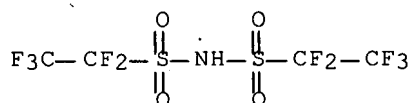
RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



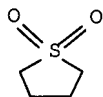
● Li

RN 132843-44-8 HCAPLUS  
 CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-pentafluoroethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IT 126-33-0, Sulfolane  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (aprotic solvent; manufacture of B-containing  
 ionically conductive polymers useful for polymeric electrolytes  
 and elec. devices)  
 RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM C08G079-08  
 ICS H01B001-06; H01M006-18; H01M010-40  
 CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 52, 76  
 ST boron core dendrimer like conductive polymer electrolyte;  
 aprotic solvent polymer electrolyte boron contg  
 polymer; battery manuf polymer electrolyte boron contg polymer;  
 capacitor manuf polymer electrolyte boron contg polymer;  
 polyoxyethylene borane adduct multiarm polymer electrolyte; star  
 block borane polyoxyethylene adduct polymer electrolyte; starburst  
 borane polyoxyethylene adduct polymer electrolyte  
 IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide  
 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate  
 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate  
 (LiBF<sub>4</sub>) 21324-40-3, Lithium hexafluorophosphate 29935-35-1,  
 Lithium hexafluoroarsenate 33454-82-9, Lithium  
 trifluoromethanesulfonate 90076-65-6 132404-42-3  
 132843-44-8  
 RL: DEV (Device component use); PRP (Properties); TEM (Technical or  
 engineered material use); USES (Uses)  
 (B-containing multiarm or dendritic polyoxyalkylene polymer

complexes; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane  
646-06-0, 1,3-Dioxolane

RL: NUU (Other use, unclassified); USES (Uses)  
(**aprotic solvent**; manufacture of B-containing  
ionically conductive polymers useful for polymeric electrolytes  
and elec. devices)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:756999 HCAPLUS Full-text

DOCUMENT NUMBER: 133:311823

TITLE: Rechargeable hybrid battery/supercapacitor  
system

INVENTOR(S): Amatucci, Glenn G.

PATENT ASSIGNEE(S): Telcordia Technologies, Inc., USA

SOURCE: PCT Int. Appl., 29 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
WO 2000063929	A1	20001026	WO 2000-US10461	200004 19
W: AU, CA, CN, IL, IN, JP, KR, SG RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 6252762	B1	20010626	US 1999-295537	199904 21
TW 463409	B	20011111	TW 2000-89106420	200004 07
CA 2370217	A1	20001026	CA 2000-2370217	200004 19
CA 2370217	C	20050208		
EP 1185991	A1	20020313	EP 2000-928199	200004 19
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002542582	T	20021210	JP 2000-612969	200004 19
AU 768608	B2	20031218	AU 2000-46469	200004 19
PRIORITY APPLN. INFO.:			US 1999-295537	A 199904 21

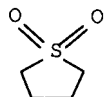
WO 2000-US10461

W

200004

19

- AB A rechargeable hybrid battery/supercapacitor elec. storage system capable of providing high energy and high power densities comprises an intercalation electrode and a capacitor electrode combined with a separator and elec.-conductive current collector elements to form a unitary cell structure. An **electrolyte solution** of a dissociable salt absorbed into the porous structure of the separator provides complementary ion species which resp. reversibly intercalate into the one electrode and capacitively adsorb at the surface of the other electrode upon the application of charging current. The high d. stored elec. energy may be recovered at high power over extended periods upon demand of a utilizing device and may be rapidly restored to stable capacity through numerous charging cycles.
- IT **126-33-0**, Sulfolane  
 RL: DEV (Device component use); USES (Uses)  
 (rechargeable hybrid battery/supercapacitor system)
- RN 126-33-0 HCAPLUS
- CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



- IC ICM H01G009-00  
 ICS H01M004-58
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 76
- IT **Transition metal** halides  
**Transition metal** halides  
 RL: DEV (Device component use); USES (Uses)  
 (fluorides; rechargeable hybrid battery/supercapacitor system)
- IT Carbon fibers, uses  
 Coke  
 Phosphates, uses  
**Transition metal** oxides  
**Transition metal** sulfides  
 RL: DEV (Device component use); USES (Uses)  
 (rechargeable hybrid battery/supercapacitor system)
- IT Fluorides, uses  
 Fluorides, uses  
 RL: DEV (Device component use); USES (Uses)  
 (**transition metal**; rechargeable hybrid battery/supercapacitor system)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 108-32-7, Propylene carbonate 110-71-4 **126-33-0**,  
 Sulfolane 616-38-6, Dimethyl carbonate 623-96-1, Dipropyl  
 carbonate 7782-42-5, Graphite, uses 7791-03-9, Lithium  
 perchlorate 12031-95-7, Lithium titanium oxide Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub>  
 14283-07-9, Lithium tetrafluoroborate 14797-73-0, Perchlorate  
 14874-70-5, Tetrafluoroborate 16919-18-9, Hexafluorophosphate  
 17111-95-4 18424-17-4, Lithium hexafluoroantimonate 21324-40-3,  
 Lithium hexafluorophosphate 22537-23-1, Aluminum ion, uses  
 23713-49-7, Zinc ion, uses 33454-82-9, Lithium triflate  
 37181-39-8, Triflate 73506-93-1, Diethoxyethane 90076-65-6  
 RL: DEV (Device component use); USES (Uses)



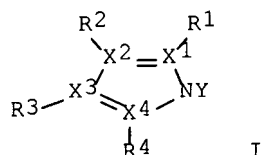
(rechargeable hybrid battery/supercapacitor system)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2000:232767 HCAPLUS Full-text  
DOCUMENT NUMBER: 132:253587  
TITLE: Electrolytes for secondary lithium batteries and  
the batteries  
INVENTOR(S): Hamamoto, Shunichi; Ueki, Akira; Abe, Hiroshi;  
Takai, Tsutomu  
PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
JP 2000106211	A	20000411	JP 1998-275624	199809 29
JP 3911870	B2	20070509	JP 1998-275624	199809 29
PRIORITY APPLN. INFO.:				

OTHER SOURCE(S): MARPAT 132:253587  
GI



AB The electrolytes, for secondary Li batteries using Li **transition metal** oxide cathodes and anodes composed of graphite having interplanar spacing  $d_{002} \leq 0.34$  nm, contain an additive having a redox potential 0.8-1.0 V high than the Li in the anode. The additive is preferably heterocyclic amide, carbamate, and/or sulfamide I, where X1-4 = C or N; Y = C1-12 acyl, ester, or **sulfonyl group**; R1-4 = H when X1-4 = N and do not exist when X1-4 = N.

IC ICM H01M010-40  
ICS H01M010-40; H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery **electrolytes**  
(**electrolyte solns.** containing heterocyclic  
nitrogen compds. for secondary lithium batteries)

IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt  
lithium oxide (CoLiO2)

RL: DEV (Device component use); USES (Uses)

(cathodes for secondary lithium batteries with  
**electrolyte solns.** containing heterocyclic nitrogen  
compsd.)

- IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate  
21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte solns.** containing heterocyclic  
nitrogen compds. for secondary lithium batteries)
- IT 28188-08-1, 1-Methoxycarbonyl pyrazole 40322-20-1,  
1-Methoxycarbonyl-1,2,4-triazole 79693-79-1 262859-70-1  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte solns.** containing heterocyclic  
nitrogen compds. for secondary lithium batteries)

L26 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1997:492802 HCAPLUS Full-text

DOCUMENT NUMBER: 127:155451

TITLE: Electrochemical capacitor with electrode and  
electrolyte layers having the same polymer and  
solvent

INVENTOR(S): Owens, Boone B.; Speckien, James M.

PATENT ASSIGNEE(S): Medtronic, Inc., USA

SOURCE: U.S., 8 pp., Division of U. S. Ser. No. 984,133.  
CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
US 5646815	A	19970708	US 1995-459918	199506 02
				199212 01
PRIORITY APPLN. INFO.:			US 1992-984133	A3

AB The capacitor comprises (a) an electrode layer containing elec. conductive C, a soluble salt, a nonaq. **aprotic liquid solvent**, and a gel-forming polymer; and (b) an ionically conductive electrolyte layer in contact with the electrode layer, containing an alkali metal salt, the same polymer, and the same solvent. Such a solid electrode material is especially well adapted for use in multilayer capacitors in which such components can be made very thin, thereby providing a very low resistance for the device and permitting rapid discharge of the capacitor.

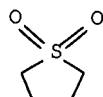
IT 126-33-0, Sulfolane 90076-65-6

RL: DEV (Device component use); USES (Uses)

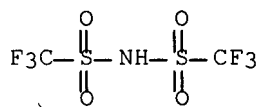
(electrochem. capacitor with electrode and **electrolyte**  
layers having same polymer and solvent containing)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
 lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01G009-00  
 INCL 361502000  
 CC 76-10 (Electric Phenomena)  
 IT **Solvents**

(aprotic; electrochem. capacitor with electrode and  
 electrolyte layers having same polymer and solvent)

IT 96-47-9, 2-Methyl tetrahydrofuran 96-49-1, Ethylene carbonate  
 108-32-7, Propylene carbonate 112-49-2, Triglyme 126-33-0  
 , Sulfolane 7440-44-0, Carbon, uses 7791-03-9, Lithium  
 perchlorate (LiClO<sub>4</sub>) 9003-39-8, Polyvinylpyrrolidone 14283-07-9  
 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>) 25014-41-9,  
 Polyacrylonitrile 29935-35-1, Lithium hexafluoroarsenate (LiAsF<sub>6</sub>)  
 33454-82-9 57619-91-7, Polytetraethylene glycol diacrylate  
**90076-65-6**

RL: DEV (Device component use); USES (Uses)  
 (electrochem. capacitor with electrode and **electrolyte**  
 layers having same polymer and solvent containing)

L26 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1994:81555 HCAPLUS Full-text  
 DOCUMENT NUMBER: 120:81555  
 TITLE: Solid polymer electrolyte lithium batteries  
 INVENTOR(S): Alamgir, Mohamed; Abraham, Kuzhikalail M.  
 PATENT ASSIGNEE(S): EIC Laboratories, Inc., USA  
 SOURCE: U.S., 8 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
US 5252413	A	19931012	US 1992-864723	199204 07
PRIORITY APPLN. INFO.:			US 1992-864723	199204 07

AB A Li battery contains a solid polymer electrolyte comprising a poly(vinyl  
 chloride) network, a solute consisting of an alkali metal salt (e.g., LiClO<sub>4</sub>,  
 LiBF<sub>4</sub>, LiAsF<sub>6</sub>, LiCF<sub>3</sub>SO<sub>3</sub>, LiPF<sub>6</sub>, and LiNCF<sub>3</sub>SO<sub>2</sub>) dissolved in ≥1 **aprotic** organic

solvent, and a low-b.p. solvent (especially, THF) than can be evaporated at .apprx.20°. The network optionally contains poly(vinyl acetate). The preferred aprotic organic solvent is propylene carbonate, ethylene carbonate, DMSO, tetramethylene sulfone,  $\gamma$ -butyrolactone, N-Me-2-pyrrolidinone, and tri- and tetra-ethylene glycol di-Me ether.

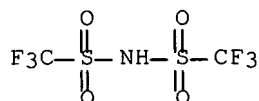
IT 90076-65-6

RL: USES (Uses)

(in solid polymer **electrolyte** for lithium battery)

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

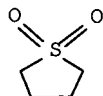
IT 126-33-0, Tetramethylene sulfone

RL: MSC (Miscellaneous)

(lithium salt-polymer electrolyte containing, for lithium battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M008-12

INCL 429192000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7791-03-9 14283-07-9 21324-40-3 29935-35-1 33454-82-9

90076-65-6

RL: USES (Uses)

(in solid polymer **electrolyte** for lithium battery)

IT 67-68-5, DMSO, miscellaneous 96-48-0,  $\gamma$ -Butyrolactone

96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

109-99-9, Tetrahydrofuran, miscellaneous 112-49-2, Tri-ethylene

glycol dimethyl ether 126-33-0, Tetramethylene sulfone

143-24-8, Tetra-ethylene glycol dimethyl ether 872-50-4,

N-Methyl-2-pyrrolidinone, miscellaneous

RL: MSC (Miscellaneous)

(lithium salt-polymer electrolyte containing, for lithium battery)

L26 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1984:619906 HCAPLUS Full-text

DOCUMENT NUMBER: 101:219906

TITLE: Electrochromic display device

PATENT ASSIGNEE(S): Sharp Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

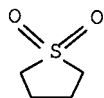
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 59077415	A	19840502	JP 1982-187968	198210 25
PRIORITY APPLN. INFO.:			JP 1982-187968	198210 25

AB An electrochromic display device with improved long term stability contains a **transition metal** compound electrochromic substance (e.g., WO<sub>3</sub>) and an ion-supplying **electrolyte solution** wherein at least part of the solvent is a sulfolane derivative (e.g., an **electrolyte solution** containing LiClO<sub>4</sub> dissolved in sulfolane).

IT 126-33-0  
 RL: USES (Uses)  
 (electrochromic display devices with **electrolyte solution** containing)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC G02F001-17; C09K009-00; G09F009-00

CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT Optical imaging devices  
 (electrochromic, with tungsten oxide layer and **electrolyte solution** containing sulfolane and lithium perchlorate)

IT 96-48-0 108-32-7 109-99-9, uses and miscellaneous 110-71-4  
 111-55-7 112-15-2 126-33-0 2926-30-9 7601-89-0  
 7791-03-9 13755-29-8 14283-07-9 21324-39-0 21324-40-3  
 33454-82-9 35678-71-8  
 RL: USES (Uses)  
 (electrochromic display devices with **electrolyte solution** containing)

L26 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1983:546855 HCAPLUS Full-text

DOCUMENT NUMBER: 99:146855

TITLE: Catalytic influence of the environment on outer-sphere electron-transfer reactions in aqueous solutions

AUTHOR(S): Bruhn, H.; Nigam, S.; Holzwarth, J. F.

CORPORATE SOURCE: Fritz-Haber-Inst., Max-Planck-Ges., Berlin, D-1000, Fed. Rep. Ger.

SOURCE: Faraday Discussions of the Chemical Society (1982), (74), 129-40  
 CODEN: FDCSB7; ISSN: 0301-7249

DOCUMENT TYPE: Journal

LANGUAGE: English

- AB The continuous-flow method with integrating observation was used to investigate irreversible electron-transfer reactions between neg. charged, substitution-inert **transition metal** complexes. Special attention was paid in order to distinguish between the different contributions to the energy of activation such as size of reactants, long-range charge interactions, influence of the free energy of reactions (difference in redox potential), and the composition (**electrolytic** content) of the **solns**. The electron-transfer reaction between  $\text{Fe}(\text{CN})_6\text{Hxx-4}$  and  $\text{IrCl}_6^{2-}$  was selected to demonstrate the catalytic rate enhancement caused by the addition of mono-, di-, and trivalent cations. In the electron transfer reaction between Ag tetraphenylporphyrin tetrasulfonate and  $\text{IrCl}_6^{2-}$ , electron transfer occurs at the axial position of the complex, far away from the neg. charged **sulfonate groups**. A catalytic effect similar to that found in the reaction with  $\text{Fe}(\text{CN})_6^{4-}$  is observed; this result precludes the cations having a bridge-like function during electron transfer. Monovalent cations of varying size show a maximum rate enhancement when their ionic radius is .apprx.0.23 nm. If long-range Coulomb interactions are shielded, and a situation in which the free energy change of reaction is zero is simulated, a maximum is extrapolated for the electron transfer rate constant of 1011/dm<sup>3</sup>/mol/s.
- CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
- ST electron transfer **transition metal** complex;  
cation catalyst electron transfer
- IT Redox reaction catalysts  
(cations, for anionic **transition metal** complexes)
- IT **Transition metals**, compounds  
RL: USES (Uses)  
(complexes, anionic, electron transfer kinetics of, influence of cations on)
- IT Kinetics of redox reaction  
(outer-sphere, between anionic **transition metal** complexes, influence of cations on)
- IT Alkali metals, uses and miscellaneous  
Alkaline earth metals  
RL: USES (Uses)  
(ions, catalytic influence of, on kinetics of electron transfer between anionic **transition metal** complexes)
- IT 7439-91-0, uses and miscellaneous 7439-93-2, uses and miscellaneous 7439-95-4, uses and miscellaneous 7439-96-5, uses and miscellaneous 7440-09-7, uses and miscellaneous 7440-17-7, uses and miscellaneous 7440-23-5, uses and miscellaneous 7440-24-6, uses and miscellaneous 7440-39-3, uses and miscellaneous 7440-45-1, uses and miscellaneous 7440-46-2, uses and miscellaneous 7440-70-2, uses and miscellaneous  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst, for electron transfer between anionic **transition metal** complexes)
- IT 14798-03-9, uses and miscellaneous  
RL: USES (Uses)  
(catalytic influence of, on kinetics of electron transfer between anionic **transition metal** complexes)
- IT 51-92-3 66-40-0 10549-76-5  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(catalytic influence of, on kinetics of electron transfer between anionic **transition metal** complexes)
- IT 30032-51-0  
RL: PROC (Process)  
(electron transfer reactions of, with anionic **transition**

metal complexes)

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